

W221
ELO H, Resection
MAP READING

ELO H W221/OCT 03/VGT-1

RESECTION

ACTION: LOCATE AN UNKNOWN POINT ON A MAP AND ON THE GROUND BY

CONDITIONS: IN A CLASSROOM ENVIRONMENT, GIVEN A 1:50,000 SCALE 'TENINO' MAP, THE LOCATION OF TWO KNOWN AND IDENTIFIABLE POINTS ON THE MAP, A STRAIGHT EDGE, GTA 5-2-12 (COORDINATE SCALE AND A PROTRACTOR), A PENCIL, AND PAPER.

STANDARD: LOCATED THE UNKNOWN POINT IN A 100,000 METER SQUARE WITH ITS IDENTIFICATION LETTERS AND SIX-DIGIT COORDINATES TO WITHIN 100 METERS OF THE ACTUAL GRID COORDINATE IAW FM 3-25.26.

ELO H W221/OCT 03/VGT-2

RESECTION

- **DETERMINE THE POSITION OF AN UNKNOWN POINT BY SIGHTING ON AT LEAST TWO, BUT PREFERABLY THREE, KNOWN POSITIONS.**
- **DETERMINE THE AZIMUTHS FROM THE UNKNOWN POINT TO THESE POSITIONS.**
- **PLOT THE BACK AZIMUTHS FROM THE KNOWN POSITIONS TO LOCATE YOUR UNKNOWN POSITION BY THEIR INTERSECTION.**

BACK AZIMUTH

**RULE #1: IF THE AZIMUTH IS MORE THAN 180 DEGR
THEN SUBTRACT 180 DEGREES.**

EXAMPLE:

AZIMUTH	215 DEGREES
	-180 DEGREES
	<hr/>
BACK AZIMUTH	35 DEGREES

**RULE #2: IF THE AZIMUTH IS 180 DEGREES OR LESS
THEN ADD 180 DEGREES.**

EXAMPLE:

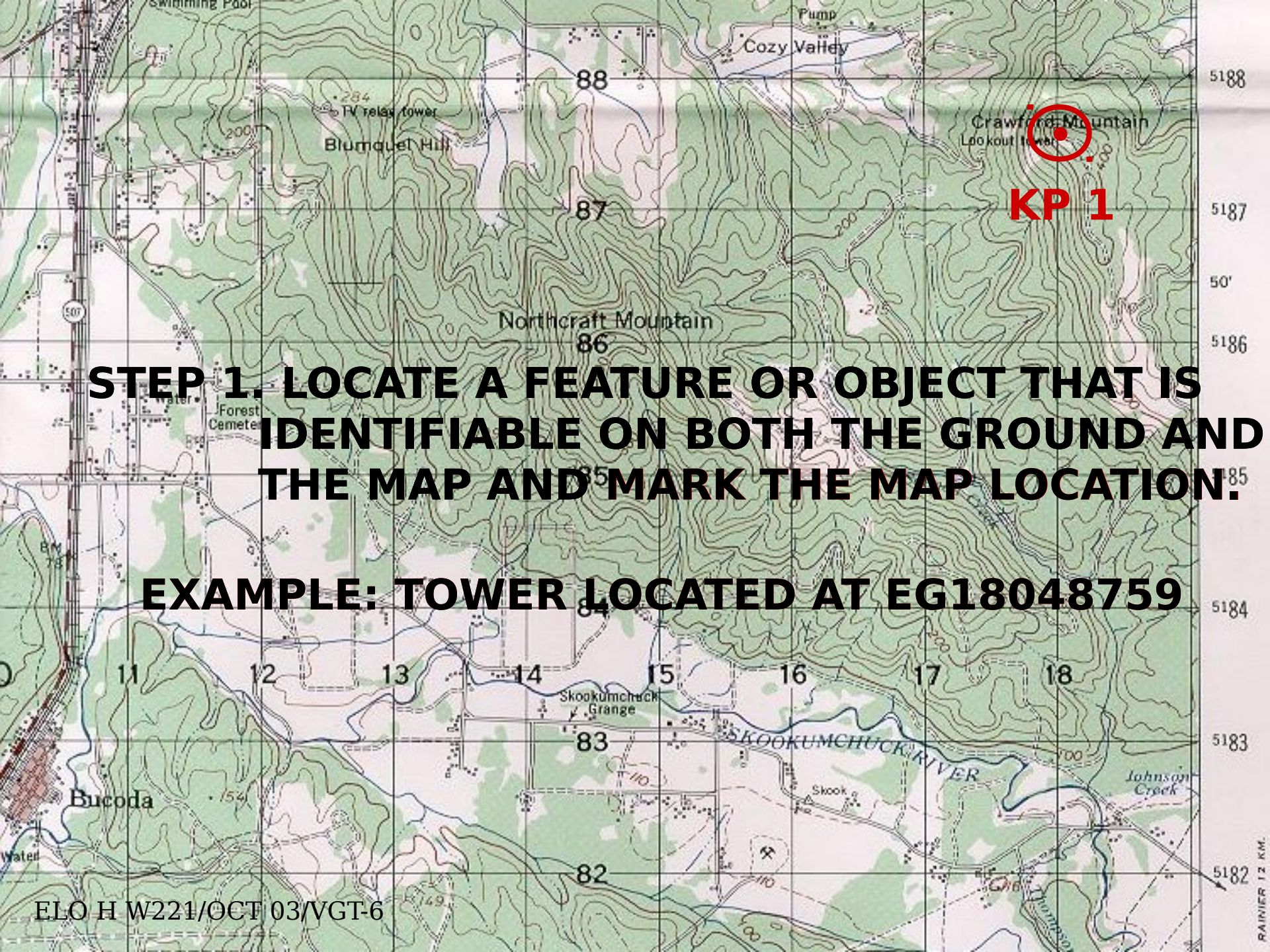
AZIMUTH	180 DEGREES
	+180 DEGREES
	<hr/>
BACK AZIMUTH	360 DEGREES

STEP 1. LOCATE A FEATURE OR OBJECT THAT IS IDENTIFIABLE ON BOTH THE GROUND AND THE MAP AND MARK THE MAP LOCATION.



EXAMPLE: TOWER LOCATED AT **EG18048759**





KP 1

STEP 1. LOCATE A FEATURE OR OBJECT THAT IS IDENTIFIABLE ON BOTH THE GROUND AND THE MAP AND MARK THE MAP LOCATION.

EXAMPLE: TOWER LOCATED AT EG18048759

STEP 2. MEASURE THE MAGNETIC AZIMUTH TO THE
KNOWN POSITION AND CONVERT THE
MAGNETIC AZIMUTH TO A GRID AZIMUTH.



29 DEGREES
MAGNETIC



**STEP 2. MEASURE THE MAGNETIC AZIMUTH TO THE
KNOWN POSITION AND CONVERT THE
MAGNETIC AZIMUTH TO A GRID AZIMUTH.**

MAGNETIC AZIMUTH: 29 DEGREES

EASTERLY G-M ANGLE: +21 DEGREES

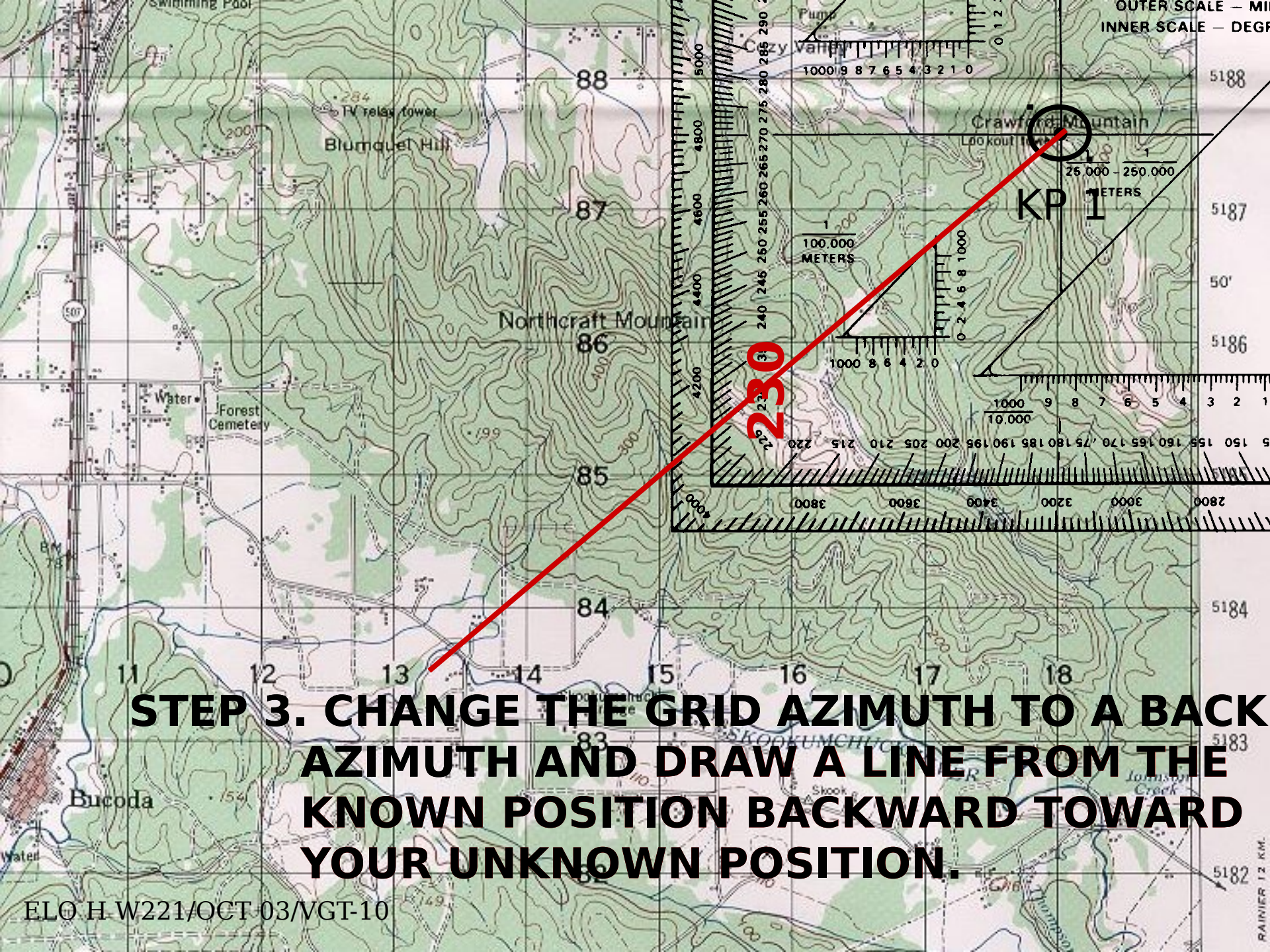
GRID AZIMUTH: 50 DEGREES

**STEP 3. CHANGE THE GRID AZIMUTH TO A BACK
AZIMUTH AND DRAW A LINE FROM THE
KNOWN POSITION BACKWARD TOWARD
YOUR UNKNOWN POSITION.**

GRID AZIMUTH: 50 DEGREES

ADD: +180 DEGREES

GRID BACK AZIMUTH: 230 DEGREES



STEP 3. CHANGE THE GRID AZIMUTH TO A BACK AZIMUTH AND DRAW A LINE FROM THE KNOWN POSITION BACKWARD TOWARD YOUR UNKNOWN POSITION.

STEP 4. LOCATE A SECOND FEATURE OR OBJECT
THAT IS IDENTIFIABLE ON BOTH THE GROUND
AND THE MAP AND MARK THE MAP LOCATION.



EXAMPLE: BRIDGE LOCATED AT **EG15008389**





EXAMPLE: BRIDGE LOCATED AT EG15008389
KP 1

STEP 4. LOCATE A SECOND FEATURE OR OBJECT
THAT IS IDENTIFIABLE ON BOTH THE GROUND
AND THE MAP AND MARK THE MAP LOCATION

**STEP 5. MEASURE THE MAGNETIC AZIMUTH TO THE
SECOND KNOWN POSITION AND CONVERT
THE MAGNETIC AZIMUTH TO A GRID AZIMUTH.**



**STEP 5. MEASURE THE MAGNETIC AZIMUTH TO THE
SECOND KNOWN POSITION AND CONVERT
THE MAGNETIC AZIMUTH TO A GRID AZIMUTH**

MAGNETIC AZIMUTH: 151 DEGREES

EASTERLY G-M ANGLE: +21 DEGREES

GRID AZIMUTH: 172 DEGREES

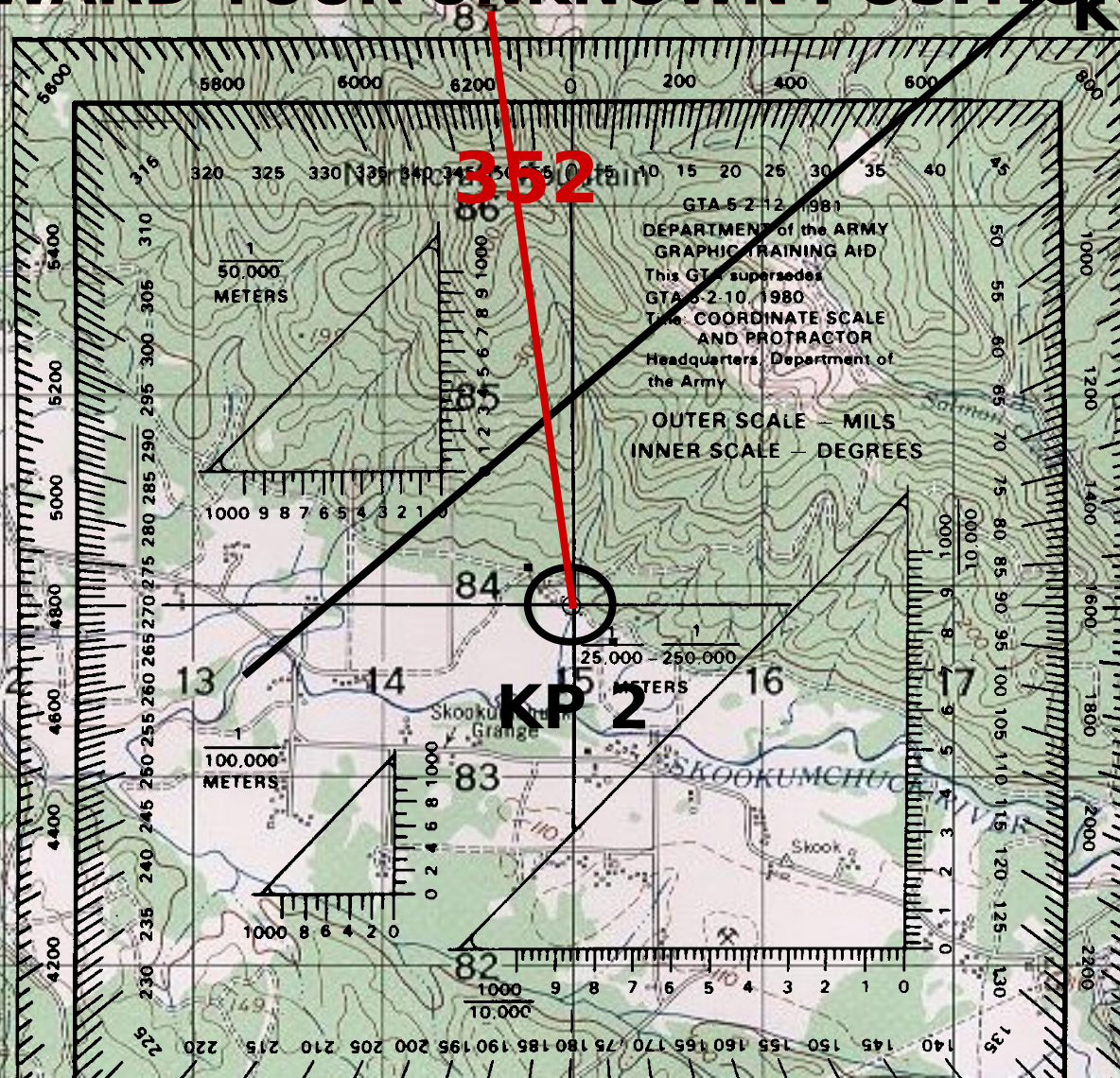
**STEP 6. CHANGE THE GRID AZIMUTH TO A BACK
AZIMUTH AND DRAW A LINE FROM THE
SECOND KNOWN POSITION BACKWARD
TOWARD YOUR UNKNOWN POSITION.**

GRID AZIMUTH: 172 DEGREES

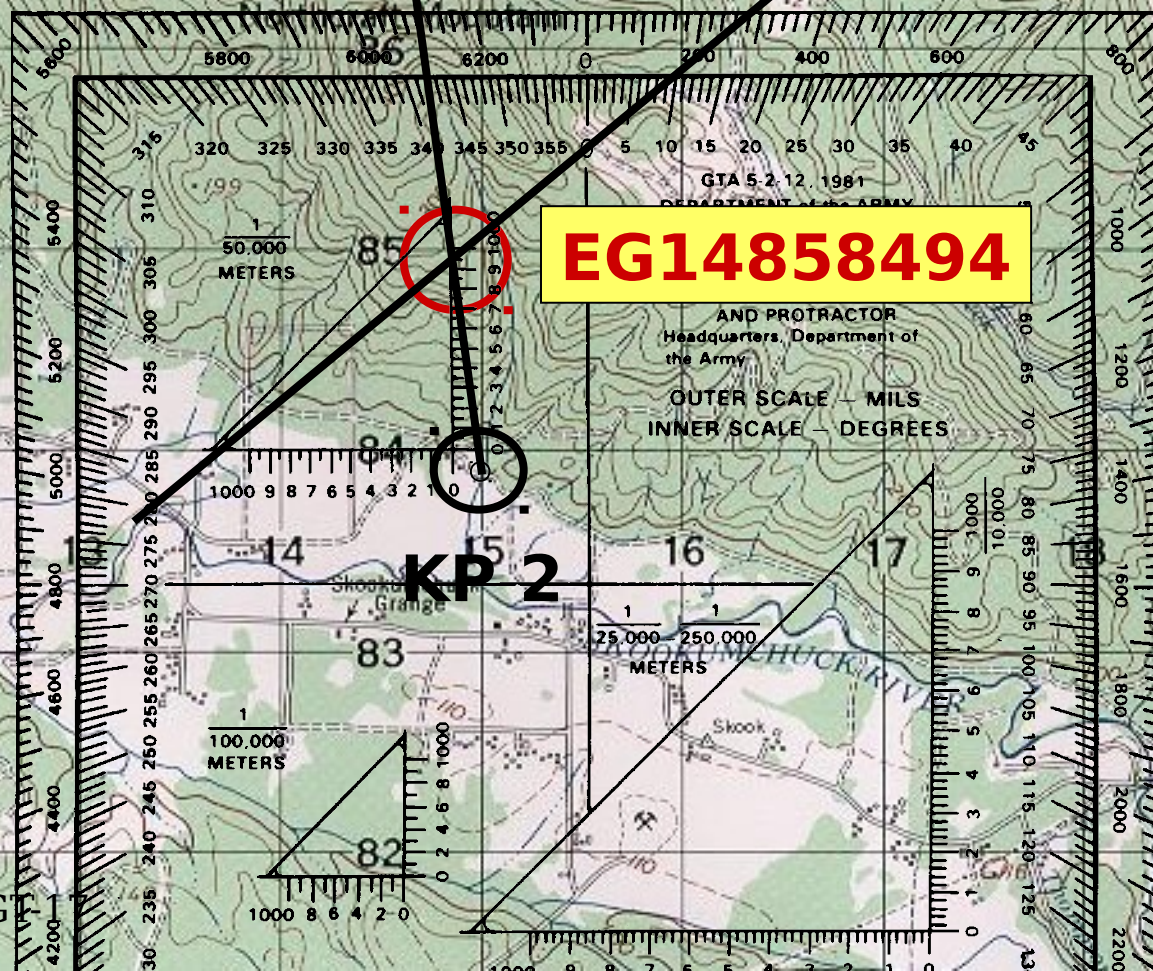
ADD: +180 DEGREES

GRID BACK AZIMUTH: 352 DEGREES

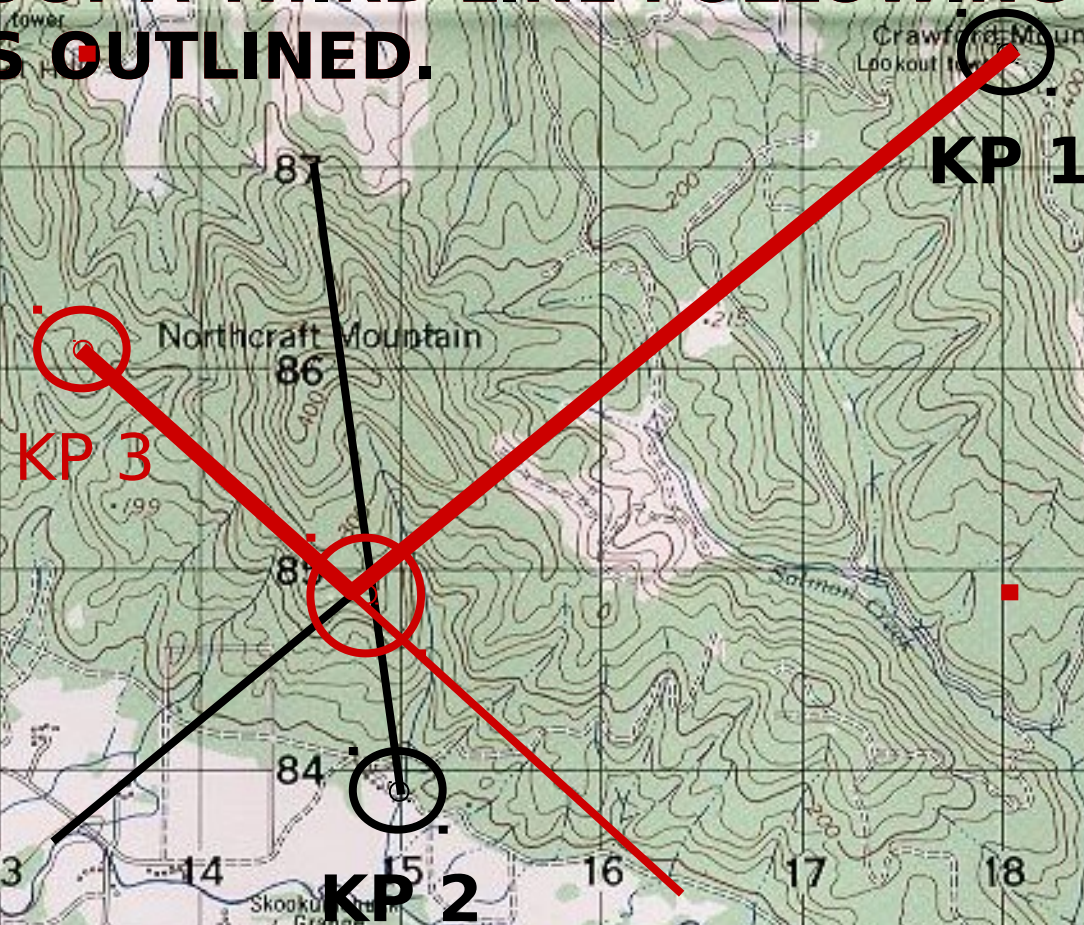
**STEP 6. CHANGE THE GRID AZIMUTH TO A BACK
AZIMUTH AND DRAW A LINE FROM THE
SECOND KNOWN POSITION BACKWARD
TOWARD YOUR UNKNOWN POSITION**



STEP 7. THE POINT WHERE THE TWO LINES INTERSECT IS YOUR LOCATION.



STEP 8. FOR A CHECK ON ACCURACY, YOU SHOULD CONSTRUCT A THIRD LINE FOLLOWING THE STEPS AS OUTLINED.



WHENEVER POSSIBLE, CHOOSE LOCATIONS THAT WILL GIVE YOU A LARGER ANGLE WHERE THE LINES INTERSECT TO INCREASE ACCURACY.

PRACTICAL EXERCISES #1

WHILE ON A RECONNAISSANCE MISSION, AN ENEMY SCOUT PLATOON DETECTS YOUR SQUAD. YOU TAKE UP A DEFENSIVE POSITION AND DECIDE TO REQUEST INDIRECT FIRE SUPPORT. YOU ARE NOT SURE OF YOUR LOCATION. FROM YOUR LOCATION, YOU CAN SEE A LOOKOUT TOWER IN GRID **EG1887** AT A MAGNETIC AZIMUTH OF 110 DEGREES AND A TV RELAY TOWER IN GRID **EG1287** AT A MAGNETIC AZIMUTH OF 215 DEGREES.

QUESTION: WHAT IS YOUR LOCATION?

ANSWER: EG155897

YOU DETERMINE A DISTANCE OF 800 METERS TO THE ENEMY WITH YOUR LASER RANGE FINDER AND A MAGNETIC AZIMUTH OF 290 DEGREES.

QUESTION: WHAT IS THE GRID LOCATION OF THE ENEMY SCOUT PLATOON?

ANSWER: EG149902

PRACTICAL EXERCISES #2

QUESTION: YOU HAVE DETERMINED THAT THE MAGNETIC AZIMUTH FROM YOUR POSITION TO THE TV RELAY TOWER IN GRID SQUARE

SQUARE **EG1287** IS 3 DEGREES AND THE MAGNETIC AZIMUTH TO THE SPOT ELEVATION 199 IN GRID

SQUARE

ANSWER: ~~EG1285~~ ~~EG118856~~ IS 77 DEGREES. WHAT IS THE SIX DIGIT GRID COORDINATE OF YOUR LOCATION?

QUESTION: THE MAGNETIC AZIMUTH FROM YOUR LOCATION TO THE WATER TOWER AT **EG093853** IS 63 DEGREES AND THE MAGNETIC AZIMUTH TO THE WATER TOWER AT **EG097827** IS 104 DEGREES. WHAT IS THE SIX DIGIT COORDINATE TO YOUR LOCATION?

ANSWER: **EG063849**

RESECTION WITHOUT A COMPASS

STEP 1. ORIENT THE MAP TO THE GROUND.

STEP 2. LOCATE AT LEAST TWO KNOWN POSITIONS ON THE GROUND AND MARK THEM ON THE MAP.

STEP 3. LAY A STRAIGHT EDGE (I.E. PROTRACTOR) WITH ONE END AT THE FIRST KNOWN POSITION AS A PIVOT POINT, THEN ROTATE THE STRAIGHT EDGE TOWARD YOURSELF UNTIL YOU SIGHT THE KNOWN POSITION ALONG THE EDGE.

STEP 4. DRAW A LINE ALONG THE STRAIGHT EDGE.

STEP 5. REPEAT PROCEDURES 1 THRU 4 FOR THE NEXT KNOWN POSITION.

STEP 6. THE INTERSECTION OF LINES IS THE LOCATION OF YOUR POSITION.

STEP 7. AGAIN, CHECK FOR ACCURACY, YOU MAY USE A THIRD POSITION.

QUESTIONS?



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